Banco Central de Chile
Documentos de Trabajo

Central Bank of Chile
Working Papers

N° 104

Agosto 2001

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BANCO CENTRAL DE CHILE

CENTRAL BANK OF CHILE

Documentos de Trabajo del Banco Central de Chile
Working Papers of the Central Bank of Chile
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CHILEAN BANKING CRISIS OF THE 1980s: SOLUTIONS AND ESTIMATION OF THE COSTS

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Resumen

Este trabajo revisa las soluciones implementadas para resolver la Crisis Bancaria Chilena de los 80s y analiza sus efectos en los bancos, derivando lecciones de política. Además se estima el costo del rescate de cada institución. Las tres principales soluciones a la crisis fueron: (i) liquidación de las instituciones insolventes o transferencia de sus activos y pasivos a instituciones solventes; (ii) compra de cartera riesgosa con pacto de recompra, sin provisión de fondos frescos; y (iii) compra de cartera riesgosa con pacto de recompra con recursos frescos, la recompra debía hacerse con las utilidades que fueran generando los bancos. Los resultados mostraron que la tercera alternativa fue la más eficiente para la recuperación de un significativo número de instituciones financieras con problemas de solvencia. Además, el apoyo a la re-capitalización bancaria y la creación de incentivos para recuperar cartera vencida ayudó a acelerar la recuperación de la industria bancaria. El costo total fue significativo. El costo de la liquidar las instituciones insolventes fue 10.6% del PIB y el costo de la compra de cartera bajo condiciones de recompra alcanzó el 6.7 % del PIB.

Abstract

This paper reviews the solutions to the Chilean banking crisis of the 1980s and analyzes their effects on banks, deriving policy lessons from this analysis. This paper also estimates the cost of the rescue of each institution. The three main solutions to the crisis were the following: (i) foreclosure of insolvent institutions or transfer of their assets and liabilities to the solvent institutions; (ii) acquisition of high-risk portfolio (bad loans) under condition of repurchase without provision of fresh funds; and (iii) acquisition of high-risk portfolio under condition of repurchase through future profits with provision of fresh funds. The results showed that the third alternative was the most efficient for the recovery of a significant number of financial institutions with solvency problems. Supporting bank re-capitalization and creating incentives for recovering bad loans helped to accelerate the recovery of the banking industry. The total cost was significant. The cost of foreclosure of insolvent institutions was 10.6 % of the GDP and the cost of portfolio purchase under conditions of repurchase reached 6.7 % of the GDP.

Advisor for the Governor of the Central Bank of Chile. The author is thankful for the valuable discussion with and comments of Ricardo Ffrench-Davis, Alito Harberger, Günther Held y José Miguel Zavala; as well as the comments of the participants of the Central Bank of Chile's seminar and the conferences of the Banco Central de la Reserva de Perú and the Superintendency of Banks and Financial Institutions of Perú. He also thanks the Accounting Department and the Financial Normalization Department of the Central Bank of Chile for the information they provided. Any opinions expressed are those of the author and not those of the Central Bank of Chile. E-mail: gsanhueza@zahleryco.cl.

1. Introduction

Crises in banking systems have been a recurring phenomenon in world economic history and have occurred more frequently in recent years. Caprio and Klingebiel (1996) estimate that there have been more than 100 episodes of banking crises since 1970. The price countries have had to pay to resolve these banking crises has been high. Caprio and Klingebiel estimate that these costs range from 10% to 55% of the GDP. However, no matter how high the price paid, not all solutions can be considered successful. In some cases, the banking system has remained weak, while in others, restoring the banking system to health brought serious macroeconomic imbalances. Among the successful cases, the solution to Chile's banking crisis in the 1980s is often cited, given that the financial system emerged strengthened and macroeconomic balances were reinforced.

This paper reviews the solution to the Chilean banking crisis of the 1980s, describing in detail the solutions implemented and analyzing the advantages and disadvantages of each. An estimate of the cost to the Central Bank of each solution, both in general and broken down by financial institution (bank or finance company), is included. The purpose of this paper is to obtain the lessons from the Chilean process.

This paper analyzes the effect of each measure on bank profits; the issue of moral hazard in future decision making; the recovery of risky loans; and the distribution of losses among shareholders, depositors, the rest of the financial

system, and the government. It also analyzes the quasi-fiscal and monetary effect of each measure, quantifying the transfer of resources, minus those recovered, carried out by the Central Bank or other state institutions.[1]

This paper offers an analysis of the programs providing direct support to the financial system, which required the transfer of government or Central Bank resources to financial institutions. These include the foreclosure of financial institutions and portfolio purchase with a buy-back clause and the modifications that followed. This paper does not focus on measures that contributed to the recovery of the financial system indirectly or without the transfer of resources, among them, debt reprogramming, the "preferential dollar" program, bank capitalization, or measures to make bank management more flexible.[2] Nor does it analyze how quasi-fiscal and monetary effect was absorbed in order to maintain macroeconomic balances during the bank recovery process.[3]

Literature dealing with the Chilean banking crisis of the 1980s is wide-ranging. However, most research focuses on the causes of the crisis and the macroeconomic effects of solutions, without evaluating the individual measures applied.[4] One paper describes and analyzes the solutions was carried out by Velasco (1991), who examined the measures implemented up to the end of the

[1] This focus is similar to that proposed by Sundararajan and Baliño (1991).
[2] Appendix A contains a complete description of the measures taken to resolve the Chilean banking crisis in the 1980s.
[3] For an analysis of how the quasi-fiscal and monetary effects were managed during the crisis, see Eyzaguirre and Larrañaga (1991) and Marshall and Schmidt-Hebbel (1994).
[4] The articles dealing with the causes of the Chilean crisis are Morandé and Schmidt-Hebbel (1988), Larraín (1989), and Velasco (1991).

1980s. Eyzaguirre and Larrañaga (1991) briefly describe the solutions implemented, also up to the end of the 1980s. In comparison, this article focuses on estimating the costs of transfers from the Central Bank to the finance sector and its financing.

Matus (1995) describes in depth the measures implemented by the Central Bank and the Superintendency of Banks and Financial Institutions to rescue the financial system, especially measures regarding the sale of institutions; however, he does not analyze these. Similarly, Nacrur (1997) offers an extensive review of banking regulations and enforcement in Chile from 1973 to the present, including a general description of the mechanisms used to resolve the banking crisis of the 1980s, but without evaluating them.

Rojas-Suarez and Weisbrod (1996) carry out an analytical review of the process of solving the Chilean banking crisis, comparing it to the Argentine solution for the same period. They conclude that the solution implemented in Chile was successful because it complied with three principles: (i) it guaranteed that those risk-takers who received most of the benefits also bore most of the costs; (ii) it prevented institutions in trouble from expanding credit to high-risk debtors or capitalizing unpaid interest on loans, and (iii) it made the restructuring of banks a priority goal over assigning public funds.

The main conclusions of the study described in this paper indicate that, in the Chilean case, three mechanisms were used to deal with financial institutions with problems of insolvency or liquidity: (i) foreclosure of the

institutions or transfer of their assets and liabilities to a solvent institution; (ii) purchase of their risk portfolios without liquid resources and with a fixed commitment for repurchase every six months, and (iii) purchase of their risk portfolios with liquid resources and a commitment to repurchase using future profits.

The foreclosure of institutions, which involved paying almost 100% of liabilities and liquidating assets, had a significant quasi-fiscal effect and increased the problems of moral hazard throughout the rest of the system. The total cost of selling off 16 financial institutions reached 10.6% of the GDP.

The purchase of portfolios without liquid resources was a temporary accounting solution that proved unable to resolve the banks' solvency problems. In contrast, portfolio purchase using liquid resources made it possible to reverse insolvency in the case of a significant number of institutions. The costs involved in this mechanism reached 6.7% of the GDP.

A range of mechanisms exist that can help to accelerate banks' recovery process, including allowing banks to issue new capital, along with the creation of incentives for the efficient administration of banks and for the recovery of risky loans. Finally, this paper outlines the precautions that authorities should take to maximize recovery of resources transferred to the finance system.

This article is organized into an introduction and three sections. Section 2 reviews and analyzes the solutions implemented. Section 3 estimates their

costs and section 4 examines the lessons that can be drawn from the Chilean case.

2. Description and Analysis of Solutions Implemented

This section provides a description and analysis of the different mechanisms used by the monetary authority and/or the government to deal with financial institutions facing problems of insolvency. We start with the mechanisms applied to those institutions that were not only experiencing serious problems, but also had committed faults under existing legal norms, with the main mechanism applied being the sale of these institutions. We then go on to examine the portfolio purchase process with a buy-back clause, available to institutions experiencing solvency problems that could, nonetheless, be expected to find resolution over time. Implementation of this second mechanism took place in four stages, which varied according to how the Central Bank paid for its portfolio purchase or the nature of the buy-back obligation assumed by the banks.

A detailed description of each mechanism follows, along with an analysis of its impact on bank profits; the problem of moral hazard in future decision-making; recovery of risky loans; and distribution of losses among shareholders, depositors, the rest of the financial system, and the government. We also analyze the quasi-fiscal and monetary effect of each mechanism, an approach proposed by Sundararajan and Baliño (1991).

2.1. Liquidation of Financial Institutions

The Superintendency of Banks and Financial Institutions intervened and foreclosed 16 financial institutions between 1982 and 1986.[5] This decision was based on the fact that these institutions had broken the laws and regulations applying to them and that all were in a state of complete insolvency due to losses that exceeded their capital and reserves.

The financial institutions' foreclosure represented 20% of the Chilean financial system, as of September 1981. Of the total 43 banks in existence at the time, eight were sold off. They held loans amounting to 17.2% of total outstanding bank loans and their capital amounted to 11.2% of the total capital of all banks. Likewise, eight of a total of 17 other financial institutions, in existence as of the end of 1981, was sold off. They held 60.5% of total loans of other financial institutions and their capital amounted to 56.3% of the total of other financial institutions' capital.[6]

2.1.1. The Liquidation Process

Liquidation consisted of the Superintendent of Banks and Financial Institutions, who officially assumed the position of liquidator, appointing a delegate liquidator. At first, every liquidation process was carried out

[5] Article 23 of the Organic Law of the Superintendency of Banks and Financial Institutions (N° 1097, of 1975) empowers the Superintendent of Banks and Financial Institutions to appoint a Delegate Inspector and a Provisional Administrator under specific circumstances. Similarly, Article 104 of Law N° 18,046, for private companies, which covers banking firms as per Article 63 of the General Bank Law General and financial companies as per Article 111 of the same Law, empowers the Superintendent of Banks and Financial Institutions to revoke the authorization creating a financial institution, under specific conditions.

[6] Appendix B contains the details about the financial institutions foreclosure.

separately, until each bank joined the Organization of Banks and Finance Companies in Liquidation, Administrative Community. This was an administrative body that operated as a cost center to optimize recovery and minimize administrative costs. The liquidator had to restructure the organization to suit liquidation processes, administer the credit portfolio to maximize returns, sell off assets using a bidding process, and apply amounts to the institution's liabilities.

For most of the sales, the Central Bank provided the liquidity necessary to cover bank liabilities and expenses during the liquidation process. Thus, for the eight financial institutions intervened and sold off between 1981 and 1982, the Central Bank provided special credit lines to pay off liabilities at 100% par value.[7] The liquidator proceeded to pay liabilities as these fell due, using the credit line. Funds provided were documented by the financing institution, with the bank or finance company then having to make payments when assets were liquidated or loans recovered. This process culminated in the Central Bank being the institution's sole remaining creditor.

For financial institutions liquidated in 1983, the liability payment mechanism was different. Demand deposits and deposits guaranteed by the state, along with those covered by complementary insurance were paid for

[7] See Matus (1995) for a detailed report on the different resolutions passed by the Central Bank's Executive Committee to provide the resources necessary for the sale of financial institutions.

using resources from the General Treasury of the Republic.[8] Chile's State Bank offered to pay for the remaining local liabilities at 70% par value. Finally, to deal with liabilities abroad, the State Bank assumed the foreign liabilities of those financial institutions up for sale, by signing an "assumption agreement" with debtor banks and the Central Bank. This agreement also covered all debts for which the bank or finance company had served as guarantor, be it for individuals or legally-constituted Chilean or foreign societies.

In the case of the two financial institutions sold off in 1986, deposits, demand, and time deposits were paid for using emergency loans from the Central Bank. These papers of its own issue were eligible for the State guarantee, which covered 100% of the value of the investment, with funds provided by the General Treasury of the Republic in this case[9].

In general, the liquidation process consisted of tendering loan portfolios and auctioning off fixed assets. However, on occasion, the Superintendency of Banks and Financial Institutions directly negotiated the transfer of certain assets and liabilities to another financial institution. Larraín (1989) mentions the case of the two largest financial institutions, which were apparently sold by

[8] Decree Law N° 1,683 of 1977 created a State guarantee for obligations stemming from time deposits and other, up to a total of 100 monthly Tributary Units, per creditor. Law N° 18,080, of December 16, 1981 provided the creditor with the option of contracting complementary insurance to a limit of approximately US $3,500 on deposits, for which the creditor had to pay and which would cover up to 75% of losses.

[9] According to Law N° 18,203, from the moment a financial institution begins the liquidation process, all documents of its own issue became subject to the State Guarantee.

transferring their assets and liabilities to two prestigious foreign banks, thus avoiding any interruption in deposits.

2.1.2. Analysis of the Liquidation of Financial Institutions

Liquidation of a financial institution with loss-related solvency problems limits losses to the total reached at a given point in time. The way liquidation was carried out between 1981-1982, by paying all depositors 100% of their deposits, generated moral hazard among other depositors in the system. It was explicitly stated that deposits in other financial institutions were covered by state insurance, although the insurance law was only supposed to cover small savers.

Loan recovery was low. In fact, as Figure 1 indicates that the total net transfer to each institution, measured as a percentage of loans held by each institution, was significantly higher than the percentage of bad debt held by each institution on that date. In principle, bad debt should indicate potential losses within a bank's general portfolio. However, while bad debt for the institutions sold off ranged from 1% to 12% of loans, effective losses, including liquidation expenses, ranged from 30-120% of each institution's loans.

There are two possible explanations for this significant difference. The first explanation is that the banks were not measuring their bad portfolio accurately.[10] The second is that liquidation, or the way in which it was carried out, led to minimal recovery of loans.[11]

[10] In early 1980, the Superintendency of Banks and Financial Institutions had taken some measures to

The liquidation process distributed losses among the banks' shareholders and the government or the Central Bank, while depositors lost little. Further, the rest of the financial system did not have to internalize any kind of loss. In fact, interbank credits of the liquidated institutions were paid at 100% par value.

The liquidation of financial institutions involved a significant transfer of liquid resources from the Central Bank or other government institutions to financial institutions. From this point of view, the liquidation process had significant quasi-fiscal effects.

However, the liquidation of 11 financial institutions during 1981-1982 was not enough to put the financial system back on its feet. In mid-1982, the banking system's problems were systemic. This led authorities to implement a new mechanism for dealing with institutions that remained solvent but had serious short-term problems. This mechanism consisted of purchasing the portfolio with a buy-back clause, to be analyzed in the next section.

improve the banks' risk evaluation system. In February 1980, it had begun to classify the 30 main debtors of each bank, while in June of that year, it increased the number of classified debtors to 80, and in April 1981, it requested the classification of 400 debtors. This measured indicated the concern of the Superintendency of Banks and Financial Institutions about the quality of the banking information.

[11] Insufficient information is available to permit an after-the-fact evaluation of the efficiency of portfolio liquidation processes of the institutions that were sold off.

2.2. Purchase of Risk Portfolio with Compulsory Buy-Back

Between 1982 and 1987, the Central Bank of Chile offered to buy part of commercial banks' and finance companies' risk portfolio, subject to an eventual buy-back of it. The purpose of this measure was to avoid banks going broke. If banks had included provisions, as they should have for all loans sold to the Central Bank, losses would have surpassed capital and they would have gone bankrupt.

Table 1 shows that the Central Bank bought total loans worth 227 million of UF between 1982-1987. [12] These were the equivalent of 30% of the system's total outstanding loans for that period and 25% of the GDP. The largest portfolio purchases occurred in 1985, when these reached 8.6% of that year's GDP. This reflected the fact that among the financial institutions subjected to intervention in January 1983 were Chile's two largest banks of the period, the Banco of Chile and the Banco of Santiago, which were not allowed to sell their portfolios to the Central Bank until they normalized their situation and received authorization from the Superintendency of Banks and Financial Institutions, which occurred in 1985.

Total portfolio purchases were concentrated over 50% in two institutions, corresponding to 30% of the total to the Bank of Chile and 24% to the Bank of Santiago. This reflected both the size of these institutions--they were the largest banks in the system--and the fact that they sold a larger share of their loans to the

Central Bank than to other banks. The Bank of Chile sold 50% of its loans and the Bank of Santiago sold 60%, compared to the remaining banks and finance companies, which, on average, sold 30% of their loans[13].

The portfolio purchase mechanism was applied in four stages, the first between July 1982 and February 1984, during which period the institutions sold portfolios worth almost 82 million UFs. During the second stage, from February 1984 to August 1987, institutions sold almost 140 million UFs. During the third and fourth stages, there were no further portfolio sales. Rather, there were significant changes made to the portfolio purchase timetable defined during the second stage.[14]

2.2.1. Portfolio Purchase Process: First Stage

During the first stage, from July 1982 to February 1984, the portfolio purchase mechanism consisted of the Central Bank buying banks' risk portfolio at par (capital plus interest) and paying for this purchase using a non-interest bearing bill of exchange maturing in ten years, with 5% amortization every six months.[15]

Similarly, each financial institution was required to buy-back 5% of its bad debt every semester. This meant that the bank provided the Central Bank with resources via the repurchase of 5% of its portfolio, while the Central Bank

[12] The UF is a unit of account used in the Chilean economy. It is daily readjusted according to the average daily inflation of the preceding month, from the 10th day of every month.
[13] Appendix C shows purchase of portfolio by institution.
[14] See Sanhueza and Zavala (2001) for details of the main resolutions regulating portfolio purchases in 1982 made by the Central Bank of Chile's Executive Committee.
[15] See Appendix D for amounts sold by each institution using this mechanism.

returned these resources paying 5% of the IOU. Thus, at no time was there an actual transfer of resources between the Central Bank and the banks or vice versa.

This sales mechanism was implemented using a contract between the Central Bank and the financial institution, which in turn was mandated to administer the recovery of credits sold and establish a timetable for beginning judicial proceedings on bad debt. The Central Bank was also required to take all legal steps necessary to recover them bad debt. The contract set a timetable for administrative rationalization and for deconcentrating loans, including the possible public sale of the debts of related companies, to generate the resources necessary to meet the buy-back obligation. Finally, the Central Bank could require that financial institutions include provisions for up to 100%, with a limit equivalent to 1% per month of total loans, on any portfolio subject to objection, due either to payment capacity or the fact that loans were to a related company. Later, this faculty was lifted and the administrative rationalization plan requirement replaced by an obligation to present a portfolio repurchasing timetable in order to meet the 5% semester buy-back requirement and a timetable for deconcentration of credits.

2.2.2. Analysis of the First Stage of Portfolio Purchase

The impact of this measure was to provide temporary relief to the banks' situation, increasing their profits and improving solvency indicators. In fact, provisions should have covered the bad debt held by financial institutions.

The sales of credit to the Central Bank allowed the financial institution to lift these provisions, thus increasing profits and capital.

It is difficult to determine whether this mechanism increased or reduced moral hazard within the banking system, given that depended on each bank's specific situation. In all likelihood, when offered a measure lengthening the recovery period, an institution experiencing liquidity but not solvency problems would not assume more risk. What is more, without this measure, perhaps the only possibility was to increase risk to resolve problems. In contrast, for an institution with solvency problems whose only chance for recovery called for significantly boosting risk levels to achieve higher returns, this measure offered more time to implement this strategy.

With regard to credit recovery, the portfolio purchase with the buy-back requirement mechanism kept the incentive for banks to recover their risk credits. The banks knew that every semester they would have to buy back 5% of their portfolio from the Central Bank and, as a result, those risky loans would once again appear in their portfolios. In this case, there was no assignment of losses, given that the solution mechanism rested on the premise that the banks' problems were short term and would not involve future losses. The quasi-fiscal or monetary impact was non-existent, given that, as explained, no resources were actually transferred between the Central Bank and the banks.

One initial problem with this mechanism was that it did not provide sufficient incentives for some banks to sell their portfolio to the Central Bank,

especially risk portfolios that were not yet past due or required provisions. This was because selling these credits to the Central Bank would have meant the suspension of accrued interest on that credit, which in turn would lower the banks' book profits. In fact, Harberger (1985) has suggested that the banks may have gone on renewing credits with little chance of recovery to thus continue to accrue interest on those credits.

A second problem with this rescue mechanism was that it was not designed for institutions with significant solvency problems, but rather for temporary problems resulting from a decline in portfolio quality due to a recessive phase in the economic cycle. The 5% per semester repurchase requirement was very restrictive for some banks. All this led to a significant change in the mechanism, to allow for longer time frames for institutions unable to commit firmly to a specific date for repurchase of their bad debt, to provide for the injection of liquid resources into institutions and to enhance asset profitability.

2.2.3. Portfolio Purchase Process: Second Stage

During the second stage, from February 1984 to August 1987, a new mechanism for the Central Bank's portfolio purchases was established to replace the previous one. This new mechanism consisted of the Central Bank buying the portfolio from financial institutions at par (value of the credit plus accumulated interest) up to a maximum of 2.5 times the capital and reserves of each institution. The Central Bank paid cash for purchases worth up to 1.5

times capital and reserves and paid for the remainder using a non-interest bearing bill of exchange indexed in UFs. Initially, the bill of exchange was for ten years, but this was later extended to 15 years for those institutions unable to repurchase within the ten-year period.[16]

Financial institutions had to use the cash payment they received to pay for emergency credits or similar obligations to the Central Bank. The rest could be invested in Central Bank notes over four years, indexed using the UF, at 7% annual interest, with equal, non-transferable, quarterly coupons.[17]

The financial institutions that used this mechanism to sell their risk portfolio had to apply any profits to repurchasing the portfolio they had sold. This also was done with resources generated upon recovery of a portfolio sold to the Central Bank. Similarly, the Central Bank had to apply resources received from the banks' portfolio buy-back to paying the bill of exchange owed to financial institutions. This buy-back requirement was indexed to the UF and paid 5% interest on that part of the portfolio bought using cash and 0% on the portion purchased using a bill of exchange. To avoid affecting the banks' growth capacity, the buy-back requirement was not considered a liability to define the limits on indebtedness.

To allow financial institutions to raise new capital, it was decided that any dividend corresponding to new capital paid in cash and issued after

[16] See Appendix E for amounts sold by each institution using this mechanism.
[17] In the case of the Banco de Chile, Banco de Santiago, Banco de Concepcion, and Banco Internacional, notes were due in ten years.

November 30, 1983 would not be used to buy back portfolios, unless that amount of capital was used to determine the maximum of the bad loans that could be sold to the Central Bank. Later, in 1985, capital increases offered limited dividend rights and became part of calculations to determine the percentage of portfolio to be sold. To do this, shares were created with more limited rights on revenue than would normally have been the case if the institution were not required to repurchase. Preferential rights had to be negotiated with the Central Bank, which in turn had to ensure that no capital increase would compromise the financial institution's ability to buy back credits.

The deadline for selling portfolios was extended several times. Initially it was intended to last until mid-1984, but after several extensions, the mechanism lasted until August 1987. The total amount of the sale also rose, from 2.5 to 3.5 times capital and reserves.

On several occasions, the Central Bank offered banks the chance to replace their UF-indexed notes with dollar-indexed notes and vice versa. This was necessary given that, initially, the banks sold the Central Bank debt indexed using a variety of indicators (pesos, UFs and dollars), receiving in exchange only UF-indexed assets. This generated currency mismatch in the banks that increased as the different indexing indicators shifted, endangering some financial institutions' solvency yet again. The most significant transfers were those carried out in May 1985, when the Central Bank offered financial

institutions, subject to certain limitations, the opportunity to replace UF-indexed Central Bank notes with non-transferable dollar-indexed, zero coupon notes over five years, renewable for another five years, with partial or total redemption, at LIBOR in dollars over 180 days. Between June 1985 and January 1987, notes worth 33 million UFs were substituted.[18]

In December 1987, financial institutions were allowed to replace dollar-indexed notes and interest due to date with a new, non-transferable interest-bearing UF-indexed notes, maturing in 15 years, offering interest over six months at the average rate in the financial system minus 0.5%. Altogether, notes for 28 million UFs were issued, of which 11.4 million UFs were for interest accrued and 16.6 million to replace dollar notes.[19] In the case of these new, UF-indexed notes, cash flow was on a semester basis, when interest was paid, with the main payment of principle due in 2002 when the note matured.

2.2.4. Analysis of the Second Stage of Portfolio Purchase

Changes to the portfolio purchase mechanism increased banks' profits and value. The new mechanism allowed them to exchange an asset that was not generating income, that is bad debt that no longer paid interest, for a Central Bank note that did pay interest, or to eliminate emergency credits whose

[18] See Appendix F for a breakdown of the financial institutions that replaced UF-indexed notes with dollar-indexed notes.
[19] See Appendix G y H for details on the issue of the new UF-indexed notes.

financial cost was over zero.[20] Another reason this raised bank profits was that it liberated provisions. Selling bad debt requiring provisions to the Central Bank freed up provisions. In addition, the Superintendency of Banks and Financial Institutions (1984) found that improved revenue or reduced costs allowed financial institutions to reduce spreads, which favored and strengthened their clients and ultimately improved bank portfolios. Finally, because the portfolio sales mechanism with a buy-back clause did not form part of banks' current liabilities, it did not limit their growth potential. In fact, the financial institution recovered fully, given that its obligation to buy back portfolios only applied once there was a profit.

With regard to risk and incentives for bank administration, the new mechanism was very different from the previous one, but when complemented by other measures, it reduced the problems of moral hazard or increased risk. For institutions with temporary or minor solvency problems, the new mechanism provided breathing room to ensure their institution's recovery and ultimately reduced necessity of their taking on excessive risk. Similarly, this gave institutions with serious solvency problems more time to save themselves, which probably led to greater accumulation of risk. However, this risk was controlled in two ways: first, by selling off the financial institutions with the

[20] Total portfolio sales under the new mechanism plus transfers under previous contracts reached 202 million UFs. Of these, 79 million UFs were paid for using bills of exchange and 123 million UFs were paid for using liquid resources. With these liquid resources, the banks paid for emergency credits worth 38 million UFs, and 86 million UFs went to purchasing notes.

most serious solvency problems; and second, by a government-appointed Temporary Administrator assuming control of the high risk banks and finance companies. This last measure significantly reduced the possibility of moral hazard, given that the new administration thus appointed represented the interests of the administration and the government.

Incentives to ensure payment of credits sold to the Central Bank were not very high. In fact, to recover a credit, the banks had to invest resources and, if they recovered the credit, the benefit went to the Central Bank. It is true that, to the degree in which it bought back the portfolio it had sold to the Central Bank early, its traditional shareholders would recover dividend rights and new shareholders would earn 100% of their dividends. However, with the economic crisis at its height, the likelihood of recovering a credit was so low and the banks' buy-back deadline, so distant that the incentive was not very high.

In terms of who paid the costs of the financial crisis using this mechanism, we have to consider the two kinds of subsidies involved. First, the interest rate paid was 5% on the portfolio share purchased by the Central Bank using liquid resources. This rate was lower than the market rate and lower than the Central Bank rate of 7% on its notes. Thus, even if a bank bought back all credits, the Central Bank would have provided it with resources.

Another implicit subsidy stems from the fact that there was a risk associated with portfolio buy-back, given that the probability that the banks would buy back their portfolio was less than one. In fact, several banks were

never able to buy back all credits. As a result, portfolio buy-back was a risky operation for the Central Bank, for which it should have charged a higher than risk-free interest rate. However, the buy-back requirement offered cheaper interest than the risk-free rate. This meant that some recovery costs would necessarily be borne by the Central Bank.

At the time of the crisis, bank shareholders also paid costs, since they received no dividends until banks had bought back their entire portfolio from the Central Bank. Finally, new shareholders also paid some costs, since their shares paid reduced dividends, with full rights recovered only once the bank repurchased all obligations.[21]

Quasi-fiscal and monetary effects were significant. Paying with liquid resources that had to be reinvested in a Central Bank note had no immediate monetary effect, but as coupons on these notes fell due, they expanded monetary supply. This is why, in the case of institutions involving the largest chunk of resources (those subject to intervention in January 1983), notes matured in ten years. Although widely used, this second portfolio purchase mechanism also suffered from some flaws that led to changes in the way it was implemented.

[21] New shareholders receive significant subsidies to buy shares of these banks. Sanhueza (1999) has an estimation of these subsidies.

2.2.5. Modifications to the Second Stage of Portfolio Purchase: Third Stage

In August 1989, virtually all the financial institutions that had sold risk portfolios to the Central Bank, using the mechanisms described above, took advantage of a new agreement offered by the Bank. This consisted of replacing all repurchasing obligations with a "subordinate obligation," to be expressed in UFs, with the share of the subordinate debt portfolio purchased using cash readjusted by 5%.

Under this new agreement, the Central Bank would transfer credits back to the original financial institution that had sold it the credits in the first place. In exchange, financial institutions would have to make a cash payment to the Central Bank, as an advance on their subordinate debt, with exact amounts of the economic value of this portfolio to be determined by the Superintendency of Banks and Financial Institutions, using general rules for asset evaluation.

2.2.6. Analysis of the Third Stage of Portfolio Purchase

The main impact of the banks' resuming ownership of credits sold to the Central Bank was that incentives to recover those credits improved significantly. In fact, the banks set up major departments to recover those credits. In the nineties, this led to recovery of bad debt becoming a significant component of bank revenues.

This incentive was the result of the fact that the banks repurchased these credits with a 95% discount on par.[22] Thus, each time the banks recovered a credit payment, they earned a profit of 95% of the credit's value, assuming they recovered 100% of the credit. Since profits in part belonged to new shareholders, this created a good incentive to recover the credits.

In practice, the impact on bank profits was marginal and stemmed from the recovery of credits. Similarly, there was no change in the moral hazard to bank administrators, nor did the assignment of losses change.

There also were no changes in terms of quasi-fiscal or monetary effect. The subordinate debt, that is, the fact that the banks repurchased their credits at less than par value, did not free them from their obligations to the Central Bank.

In late 1994, only five financial institutions maintained their subordinate debt with the Central Bank, and it was clear that none of them would be able to fulfill this obligation completely, even in the long term. This meant that, for these banks, this situation could have gone on indefinitely.

The obligation to pay part of profits to the Central Bank, which was in effect a tax, was generating several distortions within the banking system: (i) bank ownership was poorly defined, with traditional shareholders able to recover full dividend rights only if the banks paid off their obligations, but in the meantime enjoying only voting rights, while new shareholders held preferential rights to profits under 100%, and the Central Bank received profits

but without voting rights; (ii) to the degree that a very high share of profits was going to the Central Bank, administrative incentives were distorted, a situation that could lead to moral hazard; (iii) international capital markets were closed to banks with subordinate debt as an alternative for raising capital, and (iv) subordinate debt was limiting the banks' ability to pursue new business opportunities and internationalization. This led to a change in payment agreements to resolve the problems of these institutions.

2.2.7. New Modifications to the Second Stage of Portfolio Purchase: Fourth Stage

In July 1995, financial institutions with subordinate debt outstanding to the Central Bank were offered new forms of payment, as set out in Law 19,396 of July 1995. In essence, the new mechanism recognized that what the Central Bank would receive in payment for subordinate debt was the current value of each bank's profits flows and not the par value of the subordinate debt.

Based on this principle, the new law offered banks different ways of eliminating their subordinate debt. The new law also better protected the interests of the Central Bank, avoiding situations whereby its rights could become diluted due to changes in bank ownership through mergers or capital increases.

The new mechanism offered three options for eliminating subordinate debt. The first was to deal with the outstanding balance using an annual

[22] See Appendix I for a breakdown of the discount applied to each bank's credit purchase.

payment plan composed of 40 fixed, equal, consecutive, annual payments, at 5% interest on the share remaining from the Central Bank's cash payment and 0% for the rest. These payments were to be paid out of the annual profits to which the Central Bank had rights prior to this modification. Thus, every year the Central Bank would receive this revenue-dependent payment. If profits totaled more than the fixed payment, any difference would go into a special account to cover future deficits; if profits were less than the fixed payment, the difference would be registered as a deficit in the same account. Once the deficit in this account reached more than 20% of the respective bank's capital and reserves, the bank would have to sell shares equivalent to the maximum number of shares to which the Central Bank would have a right in order to cover the deficit.[23] Under this option, the subordinate debt would disappear once the bank made all 40 payments or sold or paid out to the Central Bank the full share package to which the Bank had rights.

The second option consisted of negotiating a timetable for tendering shares to which the Central Bank held rights. The sales plan could take up to ten years and, before each tender, the bank's own shareholders would have the first option to buy. In any case, independently of the share tender plan, as long

[23] The total number of shares over which the Central Bank held rights amounted to the difference between ownership and profit rights for the preferential series, plus the ownership share of Series A, that is those who were shareholders when the crisis occurred, multiplied by one minus the preferential rights to the series covering surpluses of less than 100%. Thus, once the shares to which the Central Bank held the rights were issued and sold, holders of preferential shares would recover their preferential rights to surpluses of 100%, but would continue to receive the same surpluses as before because the total number of shares would have risen.

as the shares were not sold, the bank had to continue to distribute surpluses to the Central Bank as per its rights. In the event that these were less than the minimum quota, the share sales plan would have to be speeded up.[24] In this case, subordinate debt was eliminated when all shares were sold.

The third option was for the bank with the subordinate debt to pay for it using a conventional transfer of shares to the Central Bank, with share values determined according to procedures defined by law. Before the Central Bank took possession of shares, the bank's shareholders could exercise their preferential option, with the Central Bank then free to define time period, price, payment schedule, and other conditions. This included the option of making a full or partial preferential offering to the bank's shareholders. Under this method, subordinate debt would therefore be extinguished once the banks handed over either the shares or the equivalent in pesos to the Central Bank.

The new law also offered banks the possibility of clearing their subordinate debt by transferring all the bank's assets and liabilities, except its subordinate debt, to a new bank that would carry on in the place of the original bank. The old bank would become the head office of a new bank whose sole goal would be investment in the new bank. The head office would then be the sole body responsible for the subordinate debt, with the new bank's shares held as collateral equivalent to the surpluses to which the Central Bank held rights.

[24] The minimum fee was calculated by multiplying average profitability of the financial system by the bank's capital plus reserves and by the Central Bank's right to surpluses.

Forms of payment and restrictions would be the same, but implemented in this fashion. In addition, the main company could set up an administrative subsidiary whose sole purpose would be to administer and pay subordinate debt. To do this, the administrating firm would reserve collateral in the form of shares in the new main bank. The new law also regulated capital increases, mergers and prepayments, protecting the interests of the Central Bank and bank shareholders.

The application of this new payment scheme allowed four of the five financial institutions still with subordinate debt outstanding to eliminate it. These were the BHIF, Internacional, Concepción, and Santiago banks. The fifth bank, the Banco de Chile, signed a new payment agreement.

The Banco BHIF opted for a share tender plan, in which shares were sold once to the bank's shareholders in both local and international markets. International shares were sold as an ADR issue. The sales agreement included the controlling group's commitment to buying a percentage of shares, thus reducing total shares offered and thereby improving sale conditions.

The Internacional and Concepción banks both opted for the conventional method of turning shares over to the Central Bank. The Central Bank immediately sold these shares to shareholders of each respective bank.

The Banco Santiago merged with the Banco O'Higgins in early 1997. The new bank also opted for paying with shares, thus leaving the Central Bank with a 38.54% stake in the newly merged bank.

The only institution still holding subordinate debt is the head company of the Banco de Chile. The former Banco de Chile accepted the new 40-payment agreement and created a new bank subsidiary, also called the Banco de Chile, with no subordinate debt obligation, a head office for this bank, which remains responsible for the subordinate debt, and a firm to administer it.

2.2.8. Analysis of the Fourth Stage of Portfolio Purchase

The solution to the subordinate debt problem had a significant impact on banks' profits and growth. Normalization of ownership facilitated capitalization and growth. The reestablishment of incentives for a healthy administration was reflected in greater efficiency.

The inclusion of new shareholders and the capital increase that shareholders make increase their share in their banks and provided an incentive for better business risk management, which reduced the problem of moral hazard. The recovery of bad debt at this stage became irrelevant, since the amounts remaining were insignificant.

This new payment mechanism did not change distribution of losses. As stated above, the essence of this mechanism was that the Central Bank recovered amounts due. Further, according to the Central Bank's own estimates, the new payment system was expected to increase recovery by 15.3%

over the agreements previously in effect.[25] The fact that the Central Bank increased its recovery rate and that the banks voluntarily accepted the new system indicated that this was a mutually beneficial situation. The new payment mechanism increased both the banks' value and the value of subordinate debt held by the Central Bank.

The banks' value increased because, as explained above, with the elimination of the subordinate debt, their growth potential increased, as did their profits. Similarly, the amount of subordinate debt directly affected bank value. The new agreements also improved the quality of Central Bank assets as they guaranteed payment in shares and shortened the recovery period.

By the end of the entire process, the distribution of losses of the banks that proved unable to buy back the entire portfolio sold to the Central Bank fell mostly on the Central Bank and the original shareholders. However, these last groups recovered part of the value of their shares, once the subordinate debt obligation was met. Share value undoubtedly dropped because capital increases diluted their participation. However, these were the owners of banks facing insolvency, with the Central Bank having to spend significant resources to bail them out.

Another group that also participated in the rescue was new shareholders who became involved through the "popular capitalism" program. These

[25] In the Application document for Law N°.19,396 on subordinate debt, dated August 1996, the Central Bank provides estimates for the financial recovery of subordinate debt and provides its reasons.

programs involved the buying of preferential shares, that is their dividend rights were lower than their level of ownership until banks fulfilled their subordinate debt obligations. When this situation remained unresolved, shares equivalent to the difference between ownership and dividend rights were issued to cover the subordinate debt. Thus, shareholders involved in "popular capitalism" also internalized part of the costs of the non-payment of total subordinated debt.

3. The Cost of the Solutions Implemented during the Chilean Banking Crisis of the 1980s.

To estimate the net cost of the different solutions implemented, there are at least three possible methods: patrimonial, cash flow and accrued, all of which are equivalent under certain conditions.[26] Using the patrimonial method, the value of resources provided by the Central Bank is estimated, along with the assets received in exchange over the period in which resources are delivered. The disadvantage of this method is in measuring the costs of portfolio purchase programs, given that assigning a value to the assets received by the Central Bank is no easy matter. The reason lies in the successive changes made to the

[26] The value of an asset is the current value of the cash flows that it generates, as we can see in the following formula:

$$VA_t = \sum_{i=1}^{n} \frac{F_{t+i}}{(1+r)^{+n}}$$

This means that if we consider asset flows until they run out and if expected flows are the same as cash, the current value method of an asset or patrimonial is the same as cash flow or accrue flows.

banks' payment schedule, making it impossible to clearly identify exactly when the portfolio was purchased.[27]

The cash flow method measures net resources effectively moving from the Central Bank to a bank and vice versa over a given period and then adds them together and applies a discount rate. This ensures the exclusion of all other movements due to accounting or other factors. In addition, because cash flow is calculated after the fact it includes all the modifications made in payment commitments.

The difference between accrued and effective cash flow has no implications when assigning an amount to the total costs involved in getting the finance system back on its feet. The difference is only relevant from the macroeconomic point of view since it requires issuing liability or selling an asset to cover the difference between accrued revenue and effective cash flow. Further, the fact that payment conditions changed over time would lead to errors using the accrued method, given that the amounts accrued do not necessarily translate into future cash flow.

One criticism leveled at the cash flow method is that it may not measure all the costs of the bank bailout. If the Central Bank exchanges an asset with a bank for the same par value, but yielding a different accrued interest or readjustment rate, then the exchange is not neutral and does not generate cash flow. This problem does not apply to portfolio purchase programs given that

payment flows into the Central Bank are not the flows generated by an asset delivered to it, that is, this is not a swap. What the Central Bank receives is covered by the payment agreement and, ultimately, this is what is reflected in cash flow.

Cost estimates using cash flow requires defining the discount or actualization rate applied to different flows over time. In this paper, we used two methodologies. The first methodology is to measure cash flow over each period expressed as a percentage of Gross Domestic Product (GDP) for this period and then add it together. As Equation 1 indicates, this implicitly assumes that society assigns a higher value to resources when they are scarcer.[28]

(1) $$\frac{VA_t}{GDP_t} = \sum_{i=1}^{n} \frac{F_{t+i}}{GDP_{t+i}}$$

where:

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[27] See Beckerman (1997) and Robinson and Stella (1988) for an analysis of the methodological aspects of measuring the net income of the Central Bank.

[28] This argument is derived from a partially equilibrium model for assigning value to assets in which the asset's value is represented by:

$$VA_t = \sum_{i=1}^{n} \beta^i \frac{U'(C_{t+i})}{U'(C_t)} F_{t+i}$$

Assuming that the utility function is logarithmic, the consumption level for each period is the same as GDP and that the discount factor is 1, the asset's value is determined by

$$\frac{VA_t}{GDP_t} = \sum_{i=1}^{n} \frac{1}{GDP_{t+i}} F_{t+i}$$

which is equal to equation 1.

VA_t: present value at t,

F_{t+i}: flow in period t+I,

GDP_{t+i}: gross domestic product in period t+i.

This method for discounting flows is the equivalent of assuming that the discount rate for each period is equal to GDP growth. [29] This implies that the result is not associated with the GDP of a specific year. [30]

Alternatively, we used the more traditional methodology for determining a discount or actualization rate, which is the social opportunity cost of capital. In this way, we assume that, when the government decided to rescue the banking system, it evaluate this project as any other social project, so the relevant discount rate is the social opportunity cost of the capital.

3.1. Costs Incurred for Liquidation of 16 Financial Institutions

The total cost of liquidating 16 financial institutions was equivalent to 10.6% of the 1983 GDP when we used the social cost of capital as the discount rate, and it was equivalent to 9.4% of the GDP when we measured the cash

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29

$$PIB_{t+i} = PIB_{S=1}^{\frac{t}{1}}(1 + gt + s)$$

where:

g_{s+s}: GDP growth rate in period t+s

Substituting this in equation 1, we have

$$\frac{VA_t}{GDP_t} = \sum_{i=1}^{n} \frac{1}{GDP_{t+i}} F_{t+i}$$

30 Equation 1 shows that if you measure every flow as proportion of GDP of any other period, you have to multiply numerator and denominator by the same number, so the result does not change.

flow as a proportion of each year's GDP. These amounts measure net cash flow out of the Central Bank, the General Treasury of the Republic, and the State Bank into financial institutions in liquidation to pay their liabilities. These flows are net because each time a liability or an obligation was paid, there was a transfer of resources from one of the three state organizations, and each time assets were sold or loans recovered, there was a cash flow from the bank toward the Central Bank.[31]

Cash flow for the 11 financial institutions liquidated during 1982 was estimated using information in the final liquidation report issued by each institution's liquidator. For the three financial institutions liquidated in 1983, the liquidator's final report only indicated the total net transfer from the State to each institution. The cash flow of these institutions was obtained by assuming a distribution of flows similar to those institutions for which cash flows were available. Likewise, for the financial institutions liquidated during 1986, we have only the total amount transferred from the State to each institution; but in this case, given that the liquidation process took only three years, we assumed that 100% of the transfer occurred the first year. In any case, these last two institutions represent only 2% of the net transfer of resources from the State.

The results are higher than those obtained by previous studies. Eyzaguirre and Larrañaga (1991) estimated that the amount transferred by the Central Bank to financial institutions in liquidation, actualized to December

1997, was 7.6% of the GDP. The difference between their results and this study's is that they examined resource transfers only for the 11 institutions liquidated in 1982, thus excluding institutions liquidated later. Nor did they measure the transfer of resources from other state entities, particularly the General Treasury of the Republic and the State Bank.

One researcher who used the same source of information as this study (liquidator's reports) is Matus (1995), who estimates that the total transfer involved in liquidating financial institutions actualized to December 1997 was the equivalent of 4.9% of the GDP. This underestimation could be the result of liquidators' reports from 1989, which were based on transfer amounts that had been indexed but did not include interest, given that the credit lines provided by the Central Bank to liquidate financial institutions were not subject to interest. As Matus (1995) uses the stock of transfers up to 1989 directly from the liquidation reports, interest would only be included from that point on. In contrast, this study starts with liquidators' reports and deducted annual payment flows and then takes present values.

Table 2 shows that most resource transfers took place in 1982, when 11 financial institutions were sold. That year, the Central Bank transferred ChP106.155 billion (US$2.1 billion), 8.5% of the GDP. If you consider that, in late 1982, the monetary base had reached ChP61.491 billion, resources

[31] The total cost of liquidating 16 financial institutions is only 9.9% when we used a discount rate of 5%.

transferred to financial institutions that year represented a 172% increase. In the years that followed, resources transferred were substantially less, reaching negative amounts in the last years. This was due to the nature of the financial institutions themselves, as they capture short-term resources and transform them into medium and long-term assets, and to the fact that upon liquidation, virtually 100% of liabilities were paid for. This meant that during the early years liabilities were paid for and then recovery of some assets began.

On average, the financial institutions that were sold off lost seven times their capital and reserves, which indicates that, in effect, they were completely insolvent.

Table 3 shows that 50% of total costs were concentrated in three institutions. In fact, the liquidation of the Banco Español cost the equivalent of 2.9% of the GDP, the Banco Hipotecario 1.5% and the Banco of Talca 1.3%. [32]

3.2. Estimated Costs of Portfolio Purchase Programs

The total net cost to the Central Bank of the portfolio purchase program was equivalent to 6.7% of the 1983 GDP, when we used the social cost of capital as the discount rate, and it was equivalent to 5.4% of GDP when we measured the cash flow as a proportion of each year's GDP. Cash flow estimates are divided into two parts: flows from the Central Bank to Financial Institutions for payment of portfolio purchases, which reached 8.9% of GDP,

[32] See appendix J y K with the cash flow and an estimation of the cost using the opportunity cost of capital for the Central Bank.

and cash flows from Financial Institutions to the Central Bank for buying back portfolios, which reached 2.2% of the GDP.[33]

To build cash flow from the Central Bank to Financial Institutions, we considered the different ways in which the Central Bank paid for its portfolio purchases and the changes introduced in payment mechanisms over time. During the first stage, there was no cash flow because purchases were paid for using a note whose maturity date exactly matched the required buy-back date.

During the second stage, we must distinguish between three different forms of payment: (i) using cash, with the obligation to prepay emergency credits; (ii) using cash, with the obligation to buy a Central Bank note; and (iii) using a bill of exchange. The cash payment, which required that the financial institution prepay its emergency credits, is a cash flow paid out the moment the financial institution received the emergency credit; for the purpose of this estimate, wed used the date on which the portfolio purchase took place as the moment of payment, because this includes the information on prepayment of emergency credits. Where payment is in cash, but the Financial Institution must acquire Central Bank notes, cash flow occurs the moment the Central Bank makes payment on the note's coupons, and that is considered cash flow. In the case of payment using a bill of exchange, there is no cash flow because the bill of exchange is paid for when the banks buy back their portfolio and, as such, this is a matched operation.

We also took into consideration the fact that, in May 1985, the Central Bank offered financial institutions the possibility of replacing UF-indexed notes with dollar-indexed notes. Here, again, cash flow occurs when the notes are paid for. This measure's impact on total costs was significant, given that between 1985-1989, on average, the return on dollar-indexed notes was 5.6% less than the return on UF-indexed notes.[34]

Finally, we considered that, in December 1987, there was a new process in which dollar-indexed notes were replaced with UF-indexed notes. These new UF-indexed notes generated cash flow every semester because they paid interest, with principle being paid in 2002. For the purpose of our estimates, we assumed that the last cash flow is in late 1997, discounting the future amount with the corresponding discount rate. There were also other changes in notes, but given that the amounts were minor, these were not considered.

Cash flow from financial institutions to the Central Bank was constructed on the basis of the different methods by which banks bought back their portfolios. During the first stage, flows from financial institutions to the Central Bank are not considered cash flows, given that this is a matched operation.

During the second stage, banks were required to use surpluses to buy

[33] The total net cost of the portfolio purchase program is 7.1% when we use a discount rate of 5%.

[34] Between late 1985 and late 1989, annual devaluation averaged 13% and the annual change in the UF was 18%, while average LIBOR for this period was 6.5%. This implies a Central Bank savings of around US $ 250 million.

back portfolios from the Central Bank. They also had to send the Central Bank any resources recovered from credits previously sold to the Central Bank. However, not all resources reaching the Central Bank were cash flow, given that the Bank itself was required to buy back its bills of exchange, used to pay for part of its purchase of the portfolio in the first place. Thus, while there was still a balance due on bills of exchange, the resources reaching the Central Bank were returned to financial institutions in payment for the bills of exchange and thus there was no cash flow. Once the bills of exchange were repaid, resources reaching the Central Bank remained there.

We also estimated the resources that came in as the result of portfolio sales by the Central Bank to financial institutions in August 1989, during the third stage. Central Bank payments under this item reached 7.7 million UF, 0.6% of the GDP in 1989. It is interesting to emphasize that the amount for which the Central Bank sold credits back to banks averaged only 4.3% of par.

Another source of Central Bank cash flows was prepayment of debt by some financial institutions, among them the Crédito, Edwards, and Osorno banks. This meant that, in the year in which a prepayment occurred, there would be a significant flow of resources from financial institutions to the Central Bank.

Finally, modifications during the fourth stage meant that the Central Bank received 6.3 million UFs in 1996 and 38.2 million UFs in 1997. The breakdown of these payments is as follows: (i) the Banco BHIF, in June 1996,

tendered shares worth 5.5 million UFs, which was then paid into the Central Bank; (ii) the Banco Internacional, in December 1996, issued shares accruing to the Central Bank that were sold for 0.8 million UFs; (iii) the Banco Concepcion's shares were sold for 5 million UFs in February 1997; and (iv) the Banco Santiago, in April 1997, made a payment in shares worth 33.2 million UFs. These shares remain in the hands of the Central Bank and, for cash flow purposes, are considered to be worth the same price as when the Central Bank received them in April 1997.

The only institution still holding subordinate debt is the Bank of Chile. The contract between the Central Bank and the Bank of Chile establishes that the former will receive 65.8% of any bank profits. This means that the Central Bank will receive payment for the Bank of Chile's subordinate debt in the form of 65.8% of any bank profits. We assumed a cash flow in 1997 equivalent to the present value of the future flow that will received by the Central Bank. In order to estimate this flow, we assumed that each year the Banco de Chile will be able to pay its quota, equivalent to 3.2 million of UF.

The total net cost of the portfolio purchase program found in this article is higher than that estimated by Eyzaguirre and Larrañaga (1991), as they estimated the cost incurred by the Central Bank for the portfolio purchase, actualized to December 1997, at 2.4% of the GDP. Their estimates were based on the Central Bank's balance; the authors took the amounts for portfolio purchases as amounts paid out by the Central Bank and then estimated how

much of the assets held by the Central Bank would be recovered. In this sense, it was more an estimate than a measurement. Matus (1995) did not estimate costs, but rather mentions that the subordinate debt balance in late 1994, actualized to December 1997, would be 7.4% of the GDP; however, he did not calculate how much of this could be recovered. Rojas-Suárez and Weisbrod (1995) estimated the Central Bank's recovery based on flows being received from banks still holding subordinate debt, and they estimated the loss would be 5% of GDP. This result is close to the estimates developed in the present study.

Table 4 shows that most resources were transferred in 1985, when this amount reached 3.2% of the GDP. In the years that followed, transfers were substantially lower and, from 1995 on, amounts recovered exceed amounts paid out. This is due to the fact that few notes remained to be paid and that, as we saw, several institutions started to prepay their subordinate debt.

An analysis of financial institutions shows that over 80% of the costs incurred by the Central Bank went into three financial institutions. In fact, Table 5 shows that purchase of the Banco of Chile's portfolio would have a net cost to the Central Bank of 3.6% of the GDP; for the Banco de Santiago, 1.3%; and for the Banco of Concepcion, 0.5%.[35]

4. Lessons from the Solution to the 1980s' Banking Crisis in Chile

Table 4 presents a summary of our analysis of the different mechanisms used to solve the 1980s' banking crisis in Chile. Paying out almost 100% of

liabilities of the liquidated banks was very costly (10.6% of the GDP). On average, each bank liquidated lost seven times its capital. This high cost would suggest that the banks' portfolios were of extremely poor quality.

An alternative explanation is that the liquidation process was inefficient. The closure of institutions, followed by the tendering of assets, suggests the loss of value involved in having a client base and a distribution or bank branch network, as well as the problems clients themselves could face as the result of liquidity problems leading to insolvency. In this sense, it would be better to liquidate by selling or transferring the banks as an economic unit, with the State providing the resources to cover liabilities. In addition, paying out almost 100% of the liabilities incentive moral hazard behavior in the rest of the system.

Stage 1 is the acquisition of high-risk portfolios (bad loans) under condition of repurchase without provision of fresh funds. Stage 2 is the acquisition of high-risk portfolios under condition of repurchase through future profits with provision of fresh funds. Stage 3 occurred when the Central Bank sold back to the banks their portfolios of delinquent loans. Stage 4 is the reorganization of the banks that were technically insolvent, with the Central Bank and shareholders absorbing part of the loss.

The first mechanism for portfolio purchase was a temporary accounting solution, incapable of resolving the banks' solvency problems. In fact, almost

[35] See appendix L y M for the cash flow and an estimation of the cost using the opportunity cost of capital for the Central Bank.

all of them had to go on to the second stage. Of the 33 institutions that sold their portfolios, only five solved their problems; of the rest, four were sold off and 24 had to carry on to the second stage of the process.

The main risk involved in the first mechanism was that, by allowing institutions with serious insolvency problems to continue operating, these continued to increase their risks and accumulate higher losses. The second portfolio purchase mechanism did permit the recovery from insolvency of a significant number of institutions. In fact, of the 24 institutions that took advantage of this mechanism, 11 paid everything back, five merged, four paid partially, one has outstanding payments, and the remaining four were sold off.

During this stage there was also a risk that very insolvent institutions would increase their risk even further. To control this problem, temporary administrators were appointed. Solution mechanisms were imposed to avoid interest rate or currency mismatch because, in periods of economic crisis, the relative price fluctuations are significant.

Measures to allow capitalization of banks by attracting new shareholders with limited dividend rights do not just increase bank capital, but also tend to bring bank administrators' interests into line with those of the Central Bank. The way to encourage capital increases is by allowing new shareholders to participate in bank profits and to use this capital to calculate the maximum portfolio amount that an institution may sell.

The third portfolio purchase mechanism, which allowed increased revenues from the recovery of credits sold to the Central Bank to be shared by the Central Bank and bank shareholders, improved recovery of these credits. The fourth portfolio purchase mechanism offered a solution to those institutions that had committed themselves to buying back their portfolios but that, in practice, were unlikely to be able to do so within any reasonable time frame. This solution led to a higher recovery rate for the Central Bank and is an alternative that should be considered within any portfolio purchase mechanism that includes a profit-dependent buy-back clause.

The cost of the portfolio purchase mechanisms reached 6.7% of the GDP. It is interesting to note that the Central Bank transferred resources worth 8.9% of the GDP and ended up recovering 2.2%. This mechanism was more efficient than liquidation; those who sold their portfolio held 63% of the system's loans and sold close to half their loans to the Central Bank, while those institutions that were liquidated held only 20% of loans.

The limit for determining whether a financial institution will or will not be able to recover if its risky portfolio is purchased by the Central Bank is a function of the risk portfolio to capital ratio. Equation 2 shows that if this number is less than the ratio between the bank's profitability rate divided by the real interest rate of Central Bank-supplied funds minus the growth rate of the bank, at some point, the banking institution should be able to buy back its portfolio.

(2) $\frac{BL_t}{K_t} < \frac{d}{r - f}$

where:

BL_t: amount of risky loans sold to central bank,

K_t: initial capital of the bank,

δ: long-term rate of return on capital,

ϕ: long-term bank growth,

ρ: real interest rate on funds received in cash from the Central Bank.

A reliable evaluation of the portfolio quality of financial institutions is essential to

decide when the institution is suffering from liquidity and/or solvency problems. Clearly, this was not the case for the Chilean economy, which offered at least two indicators that, with the benefit of hindsight, indicated that the risk portfolio was poorly measured: (i) the effective cost of liquidating a financial institution was several times the banks' bad debt portfolio, as can be seen in Figure 1 and (ii) the sale of risk portfolios to the Central Bank was much higher than the bad debt held by institutions, as can be seen in Figure 2. This Figure also indicates that if we eliminate those institutions subject to temporary administration, there was a direct relationship between portfolio sale and the bank's bad debt, which indicates that the inaccurate classification of the portfolio was restricted to a subset of banks.

The fact that the bad debt portfolio does not effectively reflect an institution's portfolio quality implies that all other financial indicators are also inaccurate. This is because the provisions also will be incorrect and this will affect profits, which in turn determine capital. This problem, which existed in Chilean financial institutions in the early 1980s, invalidates any empirical work with the banks' financial indicators.

One lesson that remains from the Chilean case is that certain kinds of operations exist, among them mergers, capital increases, and transfers between related firms, that, if not duly regulated, can create conflicts between bank shareholders and authorities seeking to recover transfers made by an institution. The lesson is that, before delivering resources, all these potential sources of conflict should be regulated.

The Chilean model ensured that their shareholders paid a part of the costs of recovering the financial institutions. In fact, shareholders only began to receive dividend payments once they had bought back the entire portfolio sold to the Central Bank. In the case of institutions that were liquidated, shareholders ultimately recovered nothing.

One of the weaknesses of the Chilean mode, however, is that bank shareholders at the time of the crisis received a free option. These were the owners of Chile's bankrupt banks when the Central Bank financed the bailout. There were two possible outcomes: the banks recovered and shareholders recovered their right to dividends, or shareholders never recovered their

dividend rights. One way of charging for this option was to apply a surcharge to the buy-back requirement.

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Figure 1

Net Transfer and Bad Loans of Foreclosure Financial Institutions

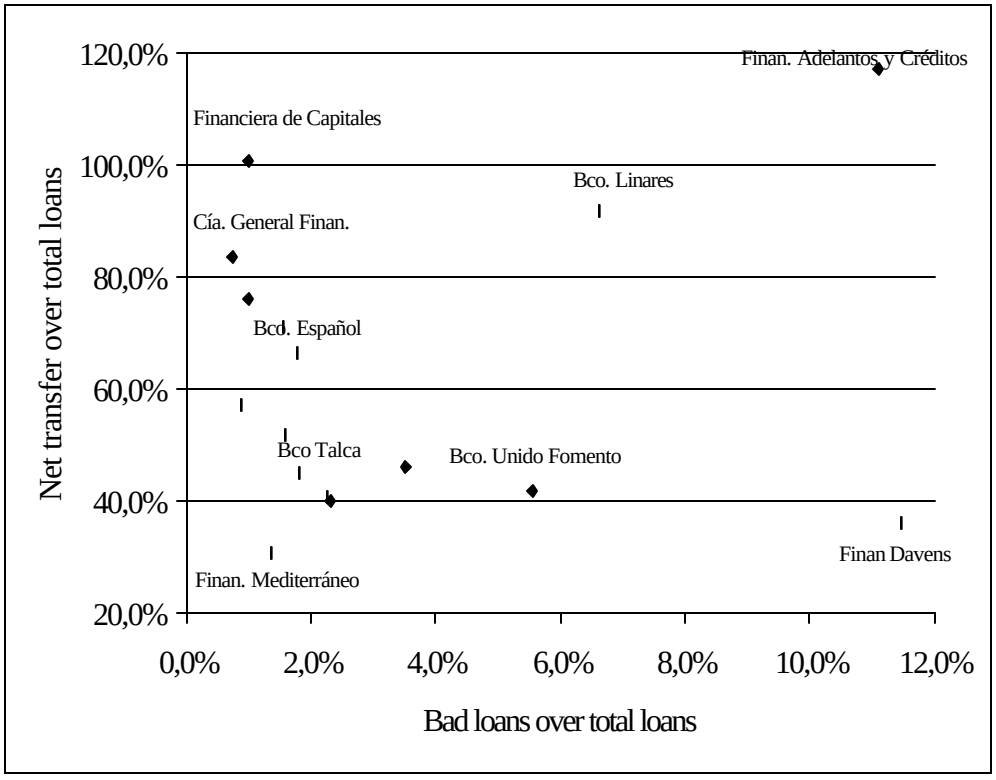
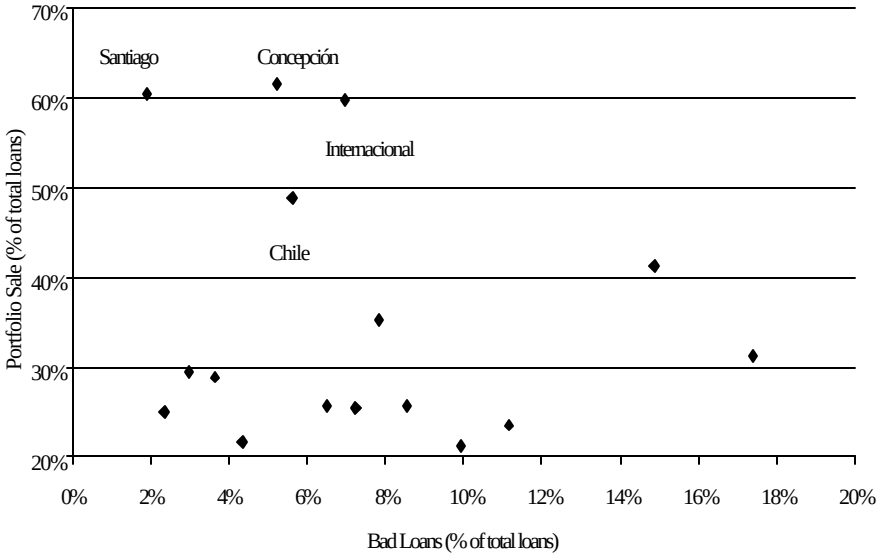


Figure 2

Portfolio Sale and Banks' Loans



The total portfolio sold by each institution is measured as a proportion of their average loans between 1982-1987. Bad loans, as a proportion of total loans, are measured in June 1982.

Source: Various issues of financial information from the Bank Superintendency and the Central Bank.

Table 1

Total Sales of Risky Loans to Central Bank

Year	Million of UF	Equivalent to: % of total loans	Equivalent to: % GDP
1982	35	4,8%	4,1%
1983	47	7,1%	5,5%
1984	20	2,7%	2,4%
1985	82	10,0%	8,6%
1986	38	4,6%	3,6%
1987	5	0,6%	0,4%
Total	227	29,8%	24,6%

These represents gross portfolio sales to the Central Bank, measured in UF, over total financial system loans and over GDP for each year.

Source: Various issues of the publication Financial Information from the Bank Superintendency and the Central Bank of Chile.

Table 2

Total Net Cost of Liquidating Financial Institutions by year

Year	Equivalent to annual GDP	Equivalent to GDP of year 1983 (discounted at the rate for social cost of capital)
1982	7,4%	8,5%
1983	2,7%	2,7%
1984	-0,1%	-0,1%
1985	-0,1%	-0,1%
1986	-0,2%	-0,2%
1987	0,0%	0,0%
1988	-0,2%	-0,1%
1989	-0,1%	-0,1%
Total	9,4%	10,6%

Table 3

Total Net Cost of Liquidating Financial Institutions by Bank

Year	Equivalent to annual GDP	Equivalent to GDP of year 1983 (discount to the rate for social cost of capital)
Banco Español	2,5%	2,9%
Banco de Linares	0,1%	0,1%
Financiera de Capitales SA	0,5%	0,5%
Banco de Talca	1,1%	1,3%
Compañía General Financiera SA	0,7%	0,9%
Banco de Fomento de Valparaíso	0,7%	0,8%
Sociedad Financiera del Sur SA	0,4%	0,5%
Financiera Cash SA	0,2%	0,2%
Banco Austral de Chile	0,3%	0,4%
Adelantos y Créditos SA	0,1%	0,2%
Banco de Fomento del Bio-Bio	0,1%	0,2%
Banco Unido de Fomento	0,9%	0,9%
Banco Hipotecario de Chile	1,5%	1,5%
Financiera Ciga	0,1%	0,1%
Financira Mediterraneo	0,1%	0,1%
Financiera Davens	0,1%	0,1%
Total	9,4%	10,6%

This measures represents total resource transfer from the Central Bank or other State institutions to liquidate financial institutions, the net of recovered amounts. The first column represents flows as a share of the GDP for the year in wich flows were generated. The second column shows annual flows discounted to year 1983 at the rate for the social cost of the capital in Chile and then expressed as a proportion of the GDP of 1983.

Table 4

Total Net Cost of Portfolio Purchase Program by Year

Year	Equivalent to annual GDP			Equivalent to GDP of year 1983 (Discount to the rate for social cost of capital)		
	Net	Disbursements	Amortization	Net	Disbursements	Amortization
1982	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
1983	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
1984	0,7%	0,7%	0,0%	0,6%	0,6%	0,0%
1985	4,0%	4,0%	0,0%	3,2%	3,2%	0,0%
1986	0,5%	0,7%	0,2%	0,4%	0,5%	0,1%
1987	0,8%	0,9%	0,1%	0,6%	0,7%	0,1%
1988	0,8%	0,9%	0,1%	0,6%	0,7%	0,1%
1989	0,5%	1,7%	1,1%	0,4%	1,2%	0,8%
1990	0,7%	1,0%	0,2%	0,5%	0,6%	0,1%
1991	0,1%	0,4%	0,2%	0,1%	0,2%	0,1%
1992	0,3%	0,3%	0,1%	0,2%	0,2%	0,0%
1993	0,2%	0,3%	0,1%	0,1%	0,2%	0,1%
1994	0,1%	0,3%	0,2%	0,1%	0,1%	0,1%
1995	-0,3%	0,2%	0,6%	-0,2%	0,1%	0,3%
1996	-0,3%	0,1%	0,5%	-0,2%	0,1%	0,2%
1997	-2,6%	1,4%	4,0%	0,5%	0,5%	0,1%
Total	5,4%	12,8%	7,3%	6,7%	8,9%	2,2%

Table 5

Total Net Cost of Portfolio Purchase Program by Bank

Financial Institution	Equivalent to annual GDP			Equivalent to GDP of year 1983 (Discount to the rate for social cost of capital)		
	Net	Disbursements	Amortization	Net	Disbursements	Amortization
Banco de Chile/Morgan	2,1%	5,0%	2,9%	3,6%	3,3%	-0,3%
Banco O´Higgins	0,1%	0,3%	0,2%	0,1%	0,2%	0,1%
Banco Internacional	0,2%	0,2%	0,1%	0,1%	0,2%	0,0%
Banco Osorno/Trabajo	0,2%	0,6%	0,4%	0,2%	0,5%	0,3%
Banco Sudamericano/Corfinsa	0,1%	0,3%	0,3%	0,1%	0,3%	0,2%
Banco Crédito e Inversiones	0,0%	0,5%	0,4%	0,1%	0,4%	0,3%
Banco Concepción	0,9%	1,2%	0,4%	0,5%	0,7%	0,2%
Banco de A. Edwards	0,0%	0,3%	0,3%	0,1%	0,2%	0,1%
Banco de Santiago	1,3%	2,8%	1,5%	1,3%	2,1%	0,7%
Banco Español-Chile	0,1%	0,3%	0,2%	0,1%	0,3%	0,2%
Banco Exterior Chile	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%
Banco Sudameris	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%
BHIF/Nacional/Banesto(Pacífi	0,4%	0,7%	0,3%	0,4%	0,5%	0,2%
Financiera Comercial	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Financiera Fusa	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Banco del Desarrollo	0,0%	0,1%	0,1%	0,0%	0,1%	0,0%
Banco Continental	0,0%	0,1%	0,1%	0,0%	0,1%	0,1%
Total	5,4%	12,8%	7,3%	6,7%	8,9%	2,2%

Amortization includes all flows received by the Central Bank in payment for portfolio purchases. Net represents the difference between both. The first set of columns represents flows as a share of the GDP for the year in which flows were generated. The second set of columns shows annual flows discounted to year 1983 at the rate for the social cost of the capital in Chile, as a proportion of the 1983 GDP.

Table 6

Marginal Effects of the Solutions to the Chilean Banking Crises

	Liquidation	**Purchase of Risky Loans**			
		Stage 1	**Stage 2**	**Stage 3**	**Stage 4**
Effect on banks profits	No	Positive but transitory	Positive	Positive	Positive
Incentive of moral hazard behavior	It was an incentive to increase risk	Insolvent bank had more incentive to increase risk	Insolvent bank had more incentive to increase risk. But, solvent bank with problems reduce their risk.	Neutral	Reduce
Incentive to recovery risky loans	Low	Neutral	Low	High	-
Distributions of losses	Shareholder and Central Bank	Neutral	Shareholder and Central Bank	Neutral	Neutral
Quasi-fiscal effect	High	No	High	Neutral	Reduce quasi-fiscal losses
Total Cost	10.6%	6.7%			

Appendix A

Main Measures Applied to Resolve the Chilean Banking Crisis during the 1980s[36]

1. Measures to Make Bank Management More Flexible

1.1. Compulsory Provisions to Cover Loan Portfolio

The period for establishing provisions to cover risk portfolio rose from 36 to 60 months. In terms of individual provisions, in practice, the original procedures involved covering non-guaranteed overdue loans within the year. This changed to phase in a 24-month period for implementing these precautionary measures. To complete this regulation, the period for writing off overdue loans covered by real guarantees rose from 24 to 36 months.

1.2. Deferred Losses Due to Sale of Goods Received in Lieu of Payment

In February 1983, the General Banks Law was modified to allow the Superintendency of Banks and Financial Institutions to accept applications for extensions of up to two years of the deadline for selling off goods received by financial institutions in lieu of payment. As a result, the Superintendency authorized automatic extensions of this deadline starting in July and covering all entities.

[36] This appendix is based on the paper "Progress in Overcoming the Financial Crisis" prepared by the Studies Department of the Superintendency of Banking and Financial Institutions, published in the

To speed up the sale of goods by financial institutions, ensuring movement of the resources involved, the authorities created several incentives. Thus, if financial institutions retained these goods, provisions were established to cover possible losses in the goods' value and, in the case of the opposite, a five-year period was set for recognizing any potential losses resulting from the sale of these goods.

1.3. Treatment of Overdue Loans

In October 1982, the deadline for including unpaid credits as overdue loans was extended from 30 to 90 days.

1.4. Treatment of Reserve Requirement

In July 1982, interest payments on the reserve requirement began; later on, this formula was applied only to the reserve required. This benefit was improved by providing a note, accruing annual interest of 5%, to be capitalized on an annual basis.

In mid-1983, the Banks Superintendency returned to the system in which deposits made using documents issued by out-of-town financial institutions were not included in calculating the reserve requirement.

report's Financial Information section.

1.5. Debt Ratio

Financial institutions were given from September 1982 to December 1983 to gradually incorporate the impact of the devaluation of their debt to capital ratio. Similarly, in October 1983, financial institutions were allowed to include provisions stemming from operating profits, used to cover their risk loans portfolio, as part of their own funds for the purpose of calculating their debt ratio, to a maximum of 25% of capital and reserves. Additionally, in October 1983, banks and other institutions were temporarily allowed to hold final losses, as of December 31 of the same year, in an Asset Account, with this balance to be charged to capital and reserves within five years.

1.6. Asset Liability Match

The margin of mismatch for indexed operations was reduced from 50% to 20% of capital and reserves to avoid further losses to those already experienced by some institutions when there were sudden fluctuations in the inflation rate. In addition, given financial institutions' natural response, that is, adopting more conservative credit policies in light of recent experience, the authorities allowed them to include indexed financial investments as assets for the purpose of balancing asset and liability operations.

2. Reprogramming of Debts

2.1. Debt Repayment Using the Preferential Dollar

The Central Bank defined a below-market-value dollar to be used by debtors for repayment of their debts. Later, the Central Bank also established

differential tranches, depending on the total amount of debt, to determine whether repurchase would be in cash or using notes. Thus, the Central Bank was to pay back the difference in cash only in the case of debts under US $20,000. For higher amounts, repayment of the difference would be in the form of notes maturing in three to five years, offering 7% per year. In early 1983, a secondary market for these notes opened, with the active participation of institutional investors, among them the Pension Fund Managers and Financial Institutions themselves.

2.2. Reprogramming of Productive Debtors

Through Agreement N° 1,507 of April 12, 1983, the Central Bank set up a refinancing system for financial institutions to reprogram the obligations of indebted producers. This essentially worked as follows:

(i) All production-related debts contracted before February 28, 1983 could exercise the right to reprogram. To do so, authorities developed a working definition of "production-related debt" that excluded consumer credit, loans documented using bills of credit, short-term credits (less than one year) to finance foreign trade operations, contingency credits, credits to non-viable debtors, credits to investment companies, and, with some limitations, credits to individuals or firms with some degree of property or management relationship with the credit-holding financial entity.

(ii) On average, the Central Bank's refinancing procedure covered about 30% of each institution's eligible debts.

(iii) Generally speaking, the amounts eligible for reprogramming were calculated as follows:

- Reprogramming was automatic, upon application by the debtor, for up to 30% of the eligible debt, to a maximum of UF 5,010.
- Once automatic reprogramming was completed, institutions could apply the rest of resources provided to extend reprogramming beyond the limits mentioned above.

(iv) In terms of the conditions applied to reprogramming, debts calculated in Chilean currency were to repay reprogrammed credits over ten years at a real annual interest of 7%. Amortizations would enjoy a grace period of five years for capital and one year for interest. For debts in foreign currency, the conditions were identical, except that the 7% interest would be calculated on the basis of maintaining reprogrammed debts in their respective foreign currency.

(v) The Central Bank's line of credit to financial institutions was to be repaid within ten years, with a one-year grace period for interest and five years for capital. The cost of the credit line was set at 5% real annual interest for reprogramming in Chilean currency and 5% of the annual change in the US dollar for the respective foreign currency. To ensure Central Bank disbursements respected monetary programming,

financial institutions had to use resources obtained from the line of credit to buy Central Bank notes over six years, with quarterly amortizations. For resources in Chilean pesos, notes were expressed as Unidades de Fomento (an inflation-indexed unit of account abbreviated as UF), plus 12% annual interest. For foreign currency resources, accrued interest was calculated as LIBOR + 2 1/8% or PRIME + 2%, depending on the financial institution's preference. These notes could only be bought and sold by other financial institutions.

2.3. Reprogramming of Mortgages

With Agreement N° 1,517, June 20, 1983, Chile's Central Bank allowed financial institutions to reprogram loans to debtors expressed as bills of credit issued up to May 1, 1983. Loans in the form of bills of credit are used primarily to finance housing through UF-indexed mortgage mutual. This program essentially worked as follows:

(i) The amounts eligible for reprogramming were:

- Total unpaid dividends for the period from June 1981 to May 1983.
- 40% of dividends originally due between July 1983 and June 1984; 30% of those due from July 1984 to June 1985; 20% of those due from July 1985 to June 1986; 10% of those due from July 1986 to June 1987.

(ii) The debtor was to pay reprogrammed amounts through a credit in UF plus 8% annual interest, with servicing to begin the month following the

end of the original mortgage mutual, and consisting of payments equal to the dividend originally agreed upon in June 1983.

(iii) In terms of financial institutions, for reprogramming late dividends from June 1981 to May 1983, the Central Bank was to provide funds in the form of a UF-indexed note, at 8% annual interest, with 18 equal, successive monthly amortizations of capital and interest. For the remainder of reprogrammed amounts, the Central Bank was to provide cash refinancing. The cost of the line of credit to financial institutions was 7% real interest per year to August 31, 1987. On that date, the line of credit could be extended for the same period covered by the reprogramming of dividends.

2.4. Sale of Homes over 20 Years

Through Agreement No. 1,506, April 6, 1983, the Central Bank set up a refinancing system for mortgages mainly for new homes, in the form of a Purchasing Authority for bills of credit issued by the financial system. This essentially worked as follows:

(i) General mortgage regulations establish that the buyer can use this mechanism to finance up to 75% of the total value of the property.

(ii) Mortgages eligible for Central Bank purchase were over 20 years, in UF, plus 8% annual interest.

(iii) The Central Bank bought these bills of credit from the financial system at par value using 12-year UF-denominated notes at 12% annual

interest, with quarterly amortization through equal and successive payments of capital and interest.

2.5. Other Reprogramming Mechanisms

In addition to the reprogramming mechanisms mentioned above, the authorities also established a special system for refinancing transportation sector debts in 1983. In addition, in 1982 and 1983, the Central Bank purchased long-term papers whose purpose was to cover reprogramming of client credits. As of December 31, 1983, bank bond issues totaled UF 22.2 million.

Finally, early reprogramming measures included the State Bank (*Banco del Estado*) program to refinance credits originating from renegotiation of debt contracted with the financial system by productive sectors before June 30, 1982. Conditions for these credits established a three- to five-year maximum servicing period. Interest ranged from 16.5% per year for UF-indexed operations to LIBOR plus 6% per year for operations calculated according to changes in the exchange rate. These conditions later moved downward to match the rates applied to other debt reprogramming measures.

3. Reactivation Credit Lines

3.1. Tenders of Indexed Resources

One of the first of this kind of measures was Agreement No. 1,464, adopted by the Central Bank in September 1982. This was designed to encourage better structuring of bank liability maturity dates and involved

providing the financial system with UF 20 million in financing. This first initiative attempted to reduce pressure on financial institutions of the period, at the same time as it established the precedent of providing funds to the financial sector more cheaply than to other sectors.

3.2. Credit Lines for Working Capital

In July 1983, using Agreement N° 1,523, the Central Bank defined a refinancing system to support productive companies by providing them with new credit to increase their working capital. The cost to users was 8% real annual interest, over 18 months. The cost to the financial institution was 5% annually. Through December 1983, this program required UF 12.7 million.

3.3. Credit Lines for Specific Purposes

Along with the new credit lines mentioned above, a series of secondary lines were developed to accomplish specific purposes, for example, refinancing wages and salaries, stimulating employment, building new basic housing and infrastructure, and reforesting the country.

3.3.1. Credit Line for Financing Remuneration

The purpose of this credit line was to encourage companies to hire labor, by providing favorable financing conditions for their payroll. Under this program, the monthly maximum remuneration eligible for credit was no more than 10% of total benefit-paying salaries and wages or Ch $ 3,500,000. The

cost to the user was set at 5% real interest per year, over 12 months. The total credit line available was UF 4.9 million, at a cost of 1% real interest for financial institutions applying for refinancing.

3.3.2. Credit Line for Hiring Additional Workers

The purpose of this credit line was to encourage more hiring of workers, by reducing financing costs for firms increasing employment. It provided credit to a monthly maximum of 40% of whichever was highest, total remuneration or Ch $5,000 per each new worker hired, using June 1983 as the baseline. The annual cost to users was 5% over six months, which could be extended to 24 months, provided the larger staff requiring the credit was maintained. The cost to financial institutions was set at 4% per year. The total amount provided was UF 1.1 million.

3.3.3. Credit Line for Housing and Engineering

This line, established by Central Bank Agreement N° 1,529, encouraged the building of new housing projects where the individual homes cost no more than UF 250 or the execution of engineering works cost no more than UF 20,000. The established users' cost was 8% per year, while the total amount reached UF 1.6 million.

3.3.4. Credit Line for Reforestation

The credit line for reforestation was another Central Bank initiative, whose purpose was to stimulate labor-intensive activities. The total amount of the credit line reached UF 600, 000, for an annual cost to users of 8%.

Appendix B

Size of the Financial Institutions' Foreclosure

I. Banks (1)	Intervention Date	Capital	Loans
		(% over total for all banks)	
Banco de Linares	11/02/81	0.3%	0.1%
Bank de Fomento de Valparaíso	11/02/81	0.9%	1.5%
Banco de Talca	11/02/81	2.3%	3.8%
Banco Español-Chile	11/02/81	3.4%	5.4%
Banco de Fomento del Bio-Bio	04/30/82	0.5%	0.4%
Banco Austral de Chile	04/30/82	0.8%	1.0%
Banco Unido de Fomento	01/13/83	1.4%	2.3%
Banco Hipotecario de Chile	01/13/83	1.7%	2.8%
Total		11.2%	17.2%

II. Other Financial Institutions (2)	Intervention Date	Capital	Loans
		(% over total for all other finan. inst.)	
Compañía General Financiera	11/02/81	13.7%	19.5%
Financiera CASH SA	11/02/81	6.4%	8.4%
Financiera de Capitales SA	11/02/81	11.2%	10.1%
Sociedad Financiera del Sur SA	11/02/81	7.9%	11.4%
Adelantos y Créditos S.A.F.	06/24/1982	2.9%	1.4%
Financiera CIGA SA	01/13/1983	4.5%	3.5%
Financiera DAVENS SA	02/13/1986	4.5%	2.8%
Financiera Mediterraneo	02/13/1986	5.3%	3.4%
Total		56.3%	60.5%

The first column represents the total portfolio that each institution sold as a proportion of total portfolio sold by the system. The second column represents each institution's total portfolio sold as a share of average loans for the 1982-1987 periods; to calculate the average, we used loans for 1982 and 1987 only. The third column represents each institution's portfolio sales over the GDP; to do so, we took sales for each year over the GDP and added them together. Source: Various issues of Financial Information from the Bank Superintendency and the Central Bank.

Appendix C

Total Sales of Risky Loans to Central Bank

	Year		Stock
	1982	1983	1983
Banco de Chile	6.1	10.9	13.3
Banco O´Higgins	1.3	1.1	1.1
Banco Internacional	0.8	0.3	0.9
Banco Osorno y la Unión	2.1	1.3	2.7
Banco Sudamericano	2.5	1.2	2.6
Banco Crédito e Inversiones	3.5	3.9	5.8
Banco del Trabajo	2.8	0.7	2.3
Banco del Pacífico	0.4	0.1	0.4
Banco Nacional	0.4	1.0	0.9
Banco Concepción	2.0	2.9	4.1
Banco Industrial y de Com. Ext.	0.2	0.4	0.0
Banco de A. Edwards	1.5	1.7	2.3
Banco de Santiago	1.4	15.7	15.9
Banco Español-Chile	2.5	0.3	1.9
Banco Exterior Chile	0.1	0.1	0.2
Banco Sudameris	0.4	0.0	0.3
Centrobanco	1.3	0.0	0.0
Banco Urquijo de Chile	0.2	0.1	0.1
Banco Unido de Fomento	1.5	-	-
Banco Hipotecario de Fom. Nac	1.7	1.9	2.1
Banco Hipotecario de Chile	1.2	-	-
Banco Colocadora Nac. de Val.	0.1	1.9	1.8
Financiera Comercial	0.1	0.0	0.1
Financiera CIGA SA	0.2	-	-
Financiera Davens	0.0	0.1	0.0
Sociedad Financiera Corfinsa	0.0	0.0	0.0
Financiera Fusa	0.1	0.2	0.1
Financiera Mediterráneo	0.1	0.0	0.1
Financiera de Interés Social	0.1	-	-
Financiera Condell SA	0.0	0.0	0.0
Banco del Desarrollo	0.1	0.5	0.6
Banco Morgan Finanza	0.0	0.7	0.3
Total	35.0	47.2	59.7

Appendix D

Amount of Risky Loans Sold by Each Institution under Accord N° 1450

(millions of UFs)

		Equivalent to:	
	% of total	% of loans of each institution	% of GDP
Banco de Chile	30.8%	49.7%	7.4%
Banco O´Higgins	2.6%	25.5%	0.7%
Banco Internacional	2.0%	59.8%	0.5%
Banco Osorno y la Unión	2.7%	26.1%	0.7%
Banco Sudamericano	3.0%	20.2%	0.8%
Banco Crédito e Inversiones	4.4%	25.6%	1.1%
Banco del Trabajo	2.5%	25.3%	0.6%
Banco del Pacífico	0.7%	24.4%	0.2%
Banco Nacional	2.0%	27.3%	0.5%
Banco Concepción	8.8%	61.5%	2.1%
Banco Industrial y de Com. Ext.	0.3%	8.0%	0.1%
Banco de A. Edwards	3.0%	28.9%	0.7%
Banco de Santiago	23.7%	60.4%	5.7%
Banco Español-Chile	2.6%	31.2%	0.7%
Banco Exterior Chile	0.3%	21.1%	0.1%
Banco Sudameris	0.3%	41.2%	0.1%
Centrobanco	0.6%	15.9%	0.2%
Banco Urquijo de Chile	0.1%	12.6%	0.0%
Banco Unido de Fomento	0.7%	11.9%	0.2%
Banco Hipotecario de Fom. Nac.	3.9%	35.1%	0.9%
Banco Hipotecario de Chile	0.5%	6.4%	0.1%
Banco Colocadora Nac. de Val.	0.9%	18.4%	0.2%
Financiera Comercial	0.2%	35.2%	0.1%
Financiera CIGA SA	0.1%	10.4%	0.0%
Financiera Davens	0.3%	38.5%	0.1%
Sociedad Financiera Corfinsa	0.1%	41.0%	0.0%
Financiera Fusa	0.4%	25.0%	0.1%
Financiera Mediterráneo	0.3%	72.3%	0.1%
Financiera de Interés Social	0.1%	15.2%	0.0%
Financiera Condell SA	0.0%	1.9%	0.0%
Banco del Desarrollo	0.6%	23.6%	0.2%
Banco Morgan Finanza	0.9%	38.6%	0.2%
Banco Continental	0.8%	51.1%	0.2%
Average		30.0%	
Total	100.0%		24.6%

Appendix E

Amount Sold by Each Institution under Accord N°1555
(Millions of UFs, include stock under Accord N°1450)

Nº	Institution	Date	Amount	Settlement		Cash used	
				note	cash payment	pay emergency credit	invest in Central Bank notes
1	Banco del Trabajo	04.05.84	2.92	0.57	2.35	1.61	0.74
2	Banco de Crédito	04.05.84	6.51	2.60	3.91		3.91
3	Banco Continental	04.05.84	1.77	0.70	1.07	1.07	
4	Banco Osorno	04.05.84	3.91	1.56	2.35		2.35
5	Banco Sudameris	04.05.84	0.51	0.00	0.51		0.51
6	Banco Español	04.05.84	4.39	1.75	2.64		2.64
7	BHIF	04.05.84	3.06	1.22	1.84		1.84
8	Banco del Desarrollo	04.05.84	1.20	0.46	0.74		0.74
9	Financiera Davens	04.05.84	0.30	0.00	0.30		0.30
10	FUSA	04.05.84	0.51	0.05	0.46		0.46
11	Banco Edwards	31.05.84	3.41	1.36	2.05		2.05
12	Banco Exterior	31.05.84	0.57	0.01	0.57		0.57
13	Banco del Pacífico	31.05.84	0.94	0.38	0.57		0.57
14	Banco Morgan	31.05.84	1.00	0.00	1.00		1.00
15	Banco Nacional	31.05.84	2.82	0.93	1.88		1.88
16	Banco O´Higgins	31.05.84	4.04	1.33	2.71		2.71
17	Banco Sudamericano	31.05.84	5.22	2.08	3.14		3.14
18	FINANCO	31.05.84	0.37	0.08	0.29		0.29
19	CORFINSA	31.05.84	0.16	0.00	0.16		0.16
20	Financiera Mediterráneo	31.05.84	0.19	0.00	0.19		0.19
21	Banco de Santiago	30.04.85	39.05	15.61	23.45	14.46	8.98
22	Banco del Trabajo	31.05.85	1.02	1.02	0.00		0.00
23	Financiera Davens	31.05.85	0.25	0.22	0.02		0.02
24	Banco O´Higgins	14.06.85	0.49	0.49	0.00		0.00
25	Banco Nacional	28.06.85	0.32	0.32	0.00		0.00
26	BHIF	28.06.85	0.01	0.01	0.00		0.00
27	Banco Edwards	28.06.85	0.01	0.01	0.00		0.00
28	FINANCO	28.06.85	0.11	0.11	0.00		0.00
29	Financiera Mediterráneo	28.06.85	0.39	0.19	0.20		0.20
30	FUSA	28.06.85	0.19	0.19	0.00		0.00
31	Banco del Desarrollo	28.06.85	0.06	0.06	0.00		0.00
32	CORFINSA	28.06.85	0.02	0.00	0.02		0.02
33	Banco del Pacífico	28.06.85	0.01	0.01	0.00		0.00
34	Banco Morgan	28.06.85	0.54	0.49	0.05		0.05
35	Banco de Chile	28.06.85	49.94	19.97	29.97	17.19	12.78
36	Banco Español	29.11.85	0.69	0.00	0.69		0.69
37	Banco Concepción	23.12.85	18.80	6.57	12.23	2.15	10.07
38	Banco Internacional	23.12.85	4.20	1.63	2.58	1.20	1.38
39	Banco de Santiago	30.05.86	11.82	4.73	7.09		7.09
40	Banco Sudamericano	30.05.86	0.52	0.21	0.31		0.31
41	Banco de Chile	27.06.86	11.53	4.61	6.92		6.92
42	Banco del Desarrollo	23.09.86	0.10	0.04	0.06		0.06
43	Banco Edwards	30.09.86	1.99	0.80	1.19		1.19
44	Banco del Pacífico	30.09.86	0.35	0.14	0.21		0.21
45	Banco de Crédito	22.10.86	1.13	0.45	0.68		0.68
46	Banco Osorno	26.11.86	1.40	0.56	0.84		0.84
47	Banco de Chile	28.11.86	1.39	0.57	0.82		0.82
48	Banco Nacional	19.12.86	0.86	0.34	0.52		0.52
49	Banco del Trabajo	23.12.86	0.66	0.26	0.39		0.39
50	Banco del Pacífico	29.12.86	0.12	0.05	0.07		0.07
51	BHIF	29.12.86	3.72	1.13	2.60		2.60
52	Banco Concepción	29.12.86	0.24	0.04	0.21		0.21
53	Banco de Santiago	30.12.86	1.75	0.70	1.05		1.05
54	Banco Crédito	12.01.87	0.58	0.23	0.35		0.35
55	Banco de Chile	16.01.87	3.13	1.25	1.88		1.88
56	Banco Edwards	11.02.87	0.53	0.21	0.32		0.32
57	BHIF	27.05.87	0.19	0.19	0.00		
58	BHIF	30.06.87	0.02	0.02	0.00		
59	BHIF	26.08.87	0.39	0.39	0.00		
	Total		202.34	78.91	123.42	37.69	85.74

Appendix F

Issue of Notes under Accord N° 1649

(Millions of UFs)

Institution	Date	Amount
Banco Español	6/28/85	0.7
Banco Sudamericano	6/28/85	1.5
Banco de Santiago	6/28/85	9.0
Banco de Chile	6/28/85	12.8
Banco Exterior	6/28/85	0.3
FINANCO	6/28/85	0.1
Banco del Pacífico	6/28/85	0.1
Banco de Crédito	6/28/85	0.0
Banco Morgan	6/28/85	0.1
Banco Nacional	6/28/85	0.2
Banco del Trabajo	6/28/85	0.6
Banco Osorno	6/28/85	0.9
Banco del Desarrollo	6/28/85	0.0
Financiera Davens	6/28/85	0.0
BHIF	6/28/85	1.4
Banco O´Higgins	6/28/85	0.5
Banco Continental	6/28/85	0.0
Banco Edwards	6/28/85	1.6
Banco Sudameris	6/28/85	0.1
Banco Sudamericano	6/28/85	0.1
Banco Español	6/28/85	0.3
Banco del Trabajo	6/28/85	0.0
BHIF	6/28/85	0.0
Banco Edwards	6/28/85	0.0
Banco Osorno	6/28/85	0.0
Banco Concepción	6/28/85	0.0
Banco Internacional	6/28/85	0.3
Banco Concepción	6/28/85	2.4
Banco del Trabajo	6/28/85	0.0
Total		33.0

Appendix G

Issue of Notes under Accord N° 1836-14

Institution	Date	Amount (million of UF)
Banco Concepción	1/01/88	0.8
Banco Edwards	1/01/88	0.3
Banco Chile	1/01/88	8.4
Banco Internacional	1/01/88	0.1
Banco de Santiago	1/01/88	1.8
Banco del Pacífico	1/01/88	0.0
FINANCO	1/01/88	0.0
Total		11.4

Appendix H
Issue of Notes under Accord 1836-15

Institution	Date	Amount
Banco Concepción	1/01/88	2.2
Banco Chile	1/01/88	14.4
FINANCO	1/01/88	0.1
TOTAL		16.7

Appendix I

Discount Applied to Each Bank's Credit Purchase

(Millions of UFs)

Institution	Date	Par Value	Economic Value	Ratio Par/economic
Banco de Chile	11/10/89	65.3	3.6	5.6%
Banco Santiago	11/10/89	57.0	0.7	1.3%
Banco Concepción	11/10/89	20.3	0.9	4.2%
BHIF	11/08/89	6.5	0.3	5.0%
Ex-Nacional	10/25/89	3.6	0.0	0.3%
Osorno	11/10/89	7.3	0.7	10.1%
Edwards	11/09/89	5.8	0.1	2.3%
Sudamericano	11/09/89	4.7	0.8	16.2%
Internacional	11/10/89	3.6	0.3	7.6%
O´Higgins	11/09/89	1.8	0.2	12.6%
Pacífico	11/03/89	1.5	0.0	0.8%
Desarrollo	10/30/89	1.0	0.0	1.3%
Financo	11/06/89	0.4	0.0	2.7%
Total		178.9	7.7	4.3%

Appendix J

Total Net Cost of Liquidating the Financial Institutions by Year

(Millions of UFs)

Year	Flows without discount	Actualized at december 1997 with the Central Bank opportunity cost of fund
1982	72.5	216.0
1983	25.8	68.5
1984	-0.9	-2.2
1985	-1.4	-2.9
1986	-2.7	-5.4
1987	0.3	0.6
1988	-2.1	-3.6
1989	-1.5	-2.5
Total	90.0	268.5

Appendix K

Total Net Cost of Liquidating the Financial Institutions by Banks

(Millions of UFs)

	Flows without discount	Actualized at december 1997with the Central Bank opportunity cost of fund
Banco Español	24.3	74.3
Banco de Linares	0.8	2.5
Financiera de Capitales SA	4.4	13.7
Banco de Talca	11.0	33.2
Compañía General Financiera SA	7.0	22.2
Banco de Fomento de Valparaíso	6.9	19.9
Sociedad Financiera del Sur SA	3.7	12.0
Financiera Cash SA	1.5	4.5
Banco Austral de Chile	3.2	10.4
Adelantos y Créditos SA	0.7	4.3
Banco de Fomento del Bio-Bio	1.4	4.3
Banco Unido de Fomento	8.2	22.7
Banco Hipotecario de Chile	14.0	38.5
Financiera Ciga	0.8	2.1
Financira Mediterraneo	1.1	2.2
Financiera Davens	0.9	1.7
Total	90.0	268.5

This measures total resource transfers from the Central Bank or other State institutions to liquidate financial institutions, net of recovered amounts. The first set of columns represents flows without any discount. The second set of columns represents actualized flows through December 1997 at the average deposit rate for the financial system, used as proxy for establishing the opportunity cost of fund for the Central Bank

Appendix L

Total Net Cost of Portfolio Purchase Program by year

Year	Flows without discount			Actualized at december 1997 at the fund opportunity cost of capital for Central Bank		
	Net	Disbursements	Amortization	Net	Disbursements	Amortization
1982	-	-	-	-	-	-
1983	-	-	-	-	-	-
1984	6.5	6.5	-	15.0	15.0	-
1985	41.4	41.8	0.4	87.8	88.6	0.8
1986	6.1	8.0	1.9	11.9	15.6	3.7
1987	10.2	11.1	1.0	18.5	20.2	1.7
1988	11.0	12.5	1.5	19.1	21.7	2.6
1989	8.0	24.7	16.7	13.3	41.0	27.7
1990	10.9	14.3	3.3	17.0	22.2	5.2
1991	2.1	5.9	3.8	3.1	8.5	5.4
1992	4.4	5.8	1.4	5.9	7.8	1.9
1993	2.9	5.2	2.3	3.7	6.7	3.0
1994	2.3	5.2	2.9	2.7	6.3	3.5
1995	(7.6)	4.8	12.3	(8.6)	5.4	14.0
1996	(7.0)	3.0	10.0	(7.5)	3.2	10.7
1997	(130.0)	36.6	166.5	(54.4)	29.4	83.8
Total	(38.8)	185.4	224.1	127.6	291.7	164.1

Appendix M

Total Net Cost of Portfolio Purchase Program by bank

Financial Institution	Flows without discount			Actualized at december 1997 at the fund opportunity cost of capital for Central Bank		
	Net	Disbursements	Amortization	Net	Disbursements	Amortization
Banco de Chile/Morgan	(55.5)	82.7	138.2	55.0	114.2	59.1
Banco O´Higgins	0.1	3.1	3.1	1.2	6.1	4.9
Banco Internacional	1.7	2.8	1.1	4.0	5.3	1.3
Banco Osorno/Trabajo	(0.5)	7.7	8.3	3.8	14.6	10.9
Banco Sudamericano/Corfinsa	(0.3)	4.3	4.6	1.6	8.0	6.4
Banco Crédito e Inversiones	(1.0)	5.7	6.7	0.6	10.9	10.3
Banco Concepción	11.8	19.7	7.9	19.3	28.2	8.9
Banco de A. Edwards	(1.2)	4.6	5.7	0.6	7.3	6.7
Banco de Santiago	3.1	37.8	34.6	29.4	65.0	35.6
Banco Español-Chile	0.5	3.8	3.3	1.8	7.6	5.8
Banco Exterior Chile	0.1	0.6	0.6	0.3	1.3	1.1
Banco Sudameris	0.1	0.6	0.5	0.2	1.2	1.0
BHIF/Nacional/Banesto(Pacífico)	2.4	9.0	6.6	8.9	16.2	7.3
Financiera Comercial	0.0	0.4	0.4	0.1	0.7	0.5
Financiera Fusa	0.1	0.5	0.5	0.3	1.0	0.8
Banco del Desarrollo	(0.2)	0.9	1.1	0.3	1.8	1.5
Banco Continental	-	1.1	1.1	0.4	2.5	2.1
Total	(38.8)	185.4	224.1	127.6	291.7	164.1

Disbursements represent all funds provided by the Central Bank for portfolio purchases. Amortization includes all flows received by the Central Bank in payment for portfolio purchases. Net represents the difference between both. The first set of columns represents flows without any discount. The second set of columns represents actualized flows through December 1997 at the average deposit rate for the financial system, used as proxy for establishing the fund opportunity cost for the Central Bank.

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